INL establishes explosives test range

The U.S. Department of Energy approved a request by Idaho National Laboratory to establish a consolidated national security test range. The range will protect citizens, soldiers and infrastructure from explosive threats through the development and testing of explosive-resistant structures, protective barriers and modern detection technologies.

Terrorist bombings of U.S. military posts and government installations are on the rise throughout the world. In fact, many national security experts are concerned that these attacks could spread to various types of U.S. infrastructure, ranging from power distribution stations and dams to shopping malls and sports complexes. Idaho National Laboratory is confronting this threat head-on with comprehensive research, field-ready technologies and facilities and multidisciplinary teams of experts to develop and test materials, systems and solutions against this growing concern.

Photo: IEDS scans for explosives.

The Idaho Explosives Detection Systems scans a mail delivery vehicle for potential explosives before it enters Wright-Patterson Air Force Base.

INL is currently constructing a new multipurpose research and development explosives test range. This range has the capability of handling a variety of energetic experiments, including explosive events with a maximum charge weight of up to 20,000 pounds TNT, inert projectiles with a maximum flight of 8,000 meters and shoulder-fired rockets.

The ability to detonate large explosive charges plays a key role in characterizing explosive threats and validating computer models with realistic results. Most physical barrier design data is untested and relies heavily on empirical calculations. Security designs are based on extrapolations from textbook equations developed for the design of common construction materials. On the other hand, a terrorist bombing - a new tactic confronting national security - challenges the understanding of barrier performance against this threat.

INL's explosives test range enables our scientists to safely detonate large-scale explosives, record dynamic effects, and measure and record pressure-time histories, crater size, barrier damage and the extent of the debris. This test data is then used to validate blast effects models, enhance the accuracy of vulnerability assessment models and support the development of improved protective structures and materials.

Scientifically validated results from testing provide structural engineers, architects and government agencies accurate information as they are challenged to develop new defensive measures to protect citizens, soldiers and critical infrastructures from explosive terrorist threats.

INL's test range is staffed by some of the world's most renowned explosives and materials experts who conduct scalable performance testing and develop advanced technologies to protect the United States against threats like vehicle-borne improvised explosive devices and rocket-propelled grenades. INL explosives engineers have more than 250 years of experience in the field, and many have specialized military or doctoral degree educations.

INL has a long history of explosive effects testing and research to protect Department of Energy critical assets. This research involves identifying vulnerabilities in existing or planned facilities, developing mitigative strategies to correct these vulnerabilities and implementing protective strategies. A combination of high-performance computing and explosive testing is used to design and validate these strategies.

By combining our technical expertise, capabilities in vulnerability analysis and unparalleled testing facilities with our award-winning technology development, INL is working to increase the safety and security of American citizens, soldiers and law enforcement.

Photo: Explosive test

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INL's full-scale explosives test range allows scientists to conduct scalable performance testing to measure blast effects, shock, and vibration on structures and protective barriers.

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